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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/784,087	02/16/2001	Soon-Sung Yoo	8733.405.00	3235
30827	7590	08/23/2004	EXAMINER	
MCKENNA LONG & ALDRIDGE LLP			QI, ZHI QIANG	
1900 K STREET, NW			ART UNIT	
WASHINGTON, DC 20006			PAPER NUMBER	
			2871	

DATE MAILED: 08/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/784,087

Applicant(s)

YOO ET AL.

Examiner

Mike Qi

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 July 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 21 and 22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3-5, 21 and 22 is/are allowed.
- 6) ☒ Claim(s) 1 and 2 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,825,449 (Shin) in view of US 5,926,235 (Han et al).

Claim 1, Shin discloses (col.1, line 12 – col.2, line 28; Fig.1 and Fig.6) that a liquid crystal display device comprising:

- substrate (1);
- thin film transistor (TFT) including a gate electrode (2), a source electrode (7), and a drain electrode (8) on the substrate (1);
- pixel electrode (6) electrically connected to the drain electrode (8);
- data line (610) electrically connected with the source electrode (7);
- a gate insulating layer (3) (first insulating layer), a pure amorphous silicon layer (4), and a doped amorphous silicon layer (5) sequentially layered under the data line (610) (the data line is connected with the source electrode 7);
- data pad (2A) at one end of the data line (610) (the pad is for communicate information from an external driving circuit to the gate or source electrodes, so that the pad must be at one end of the data line or gate line);
- gate line (600) electrically connected with the gate electrode (2);

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- gate pad electrode (6B) at one end of the gate line (600) (the ITO patterns 6A and 6B are formed on the source pad 2A and the gate pad 2B, such that the ITO patterns 6A and 6B must be the pad electrodes);
- the gate pad electrode (6B) is formed of a same material (ITO) and in a same layer (see Fig.1f) as the pixel electrode (6) in a single layer over the gate insulating layer (3) (first insulating layer); and the gate insulating layer (3) includes an opening (see contact hole in Fig.1f) that exposes a portion of the gate line (600), and the gate pad electrode (6B) electrically contacts the exposed portion of the gate pad (2B) (see Fig.1f);
- a transparent conductive layer (ITO) pattern (6B) is formed on the gate pad (2B), so that the ITO pattern (6B) functions as a gate pad electrode and is directly contact over the gate insulating layer (3) (first insulating layer).

Shin does not explicitly disclose that the pixel electrode is in direct contact with the substrate.

However, Han discloses (col.5, lines 16-47; Fig.6B) that an ITO layer is deposited on the substrate (110), and is etched to form a pixel electrode (104) (see Fig.6B, the pixel electrode 104 is in direct contact with the substrate 110); and as a result of this, the defects is reduced and the manufacturing yield is improved.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange the pixel electrode direct contact the substrate as claimed in claim 1 for reducing the defects and improving the manufacturing yield.

Claim 2, Shin discloses (col.1, lines 52 – 60) that the pixel electrode (6) is

formed of transparent conductive material such as indium tin oxide (ITO).

Allowable Subject Matter

3. Claims 3-5 and 21-22 are allowed.
4. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record neither discloses nor teaches that a liquid crystal display device comprising various elements, more specifically, as the following:

the drain electrode has a through hole that exposes a portion of the first insulating layer, and the pixel electrode electrically contact an inner side surface of the drain electrode via the through hole [claim 3; as shown in Fig.6D];

the data pad contact hole passing through the doped amorphous silicon layer and passing through the amorphous silicon layer, and the data pad electrode electrically contact an inner side surface of the data pad via the data pad contact hole [claim 4; as shown in Fig.6D];

claim 21 is dependent on the claim 3; and claims 5 and 22 are dependent on the claim 4.

The closest reference US 5,825,449 (Shin) discloses a structure of a liquid crystal display device comprising a drain contact hole, a source pad contact hole (data pad contact hole) and a gate pad contact hole, but the prior art of record do not disclose the drain contact hole and the data pad (source pad) contact hole passing through the silicon layer (the pure amorphous silicon layer and the doped amorphous silicon layer),

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wherein the portions of the gate insulating layer are exposed and the pixel electrode or the data pad electrode contact the inner side surface of the drain electrode or the inner side surface of the data pad via the through holes as claimed in the claims.

Response to Arguments

5. Applicant's arguments filed July 8, 2004 have been fully considered but they are not persuasive.

Applicant's arguments are as follows:

1) The reference Shin fail to teach or suggest a liquid crystal display device that includes “. . .a pixel electrode electrically connected to the drain electrode and in direct contact with the substrate; . . .” such that amended claim 1.

Examiner's responses to Applicant's arguments are as follows:

1) The reference Shin discloses the limitations as claimed in the claim 1 as the description above. Concerning the pixel electrode is in direct contact with the substrate, the reference Han shows that the pixel electrode is in direct contact with the substrate (see Fig.6B), and such that the forming process reduces the defects and the manufacturing yield is improved.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mike Qi whose telephone number is (571) 272-2299. The examiner can normally be reached on M-T 8:00 am-5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mike Qi
August 16, 2004



TARIFUR R. CHOWDHURY
PRIMARY EXAMINER